

## BEACON APPLICATIONS FOR CONTENT DISCOVERY AND INTERACTION

### CROSS-REFERENCE TO RELATED APPLICATION

**[0001]** This application is a continuation of and claims priority to U.S. patent application Ser. No. 14/500,028, filed Sep. 29, 2014, the entire contents of which are incorporated herein by reference.

### TECHNICAL FIELD

**[0002]** This disclosure relates generally to radio frequency (RF) beacon technology and services.

### BACKGROUND

**[0003]** Bluetooth® low energy (BLE) (also referred to as Bluetooth® Smart) is a wireless personal area network (PAN) technology that can be used for a variety of client device applications and is intended to provide reduced power consumption and cost while maintaining a similar communication range as Bluetooth®. Many mobile operating systems for smart phones, tablet computers and wearable devices support Bluetooth® Smart. The technical specifications for BLE are described in Bluetooth® Core Specification 4.0, which is a public document made available online by Bluetooth® Special Interest Group (SIG).

**[0004]** One potential application provided by BLE technology is proximity sensing. BLE beacons broadcast a Universally Unique Identifier (UUID), which can be detected by a compatible application or operating system running on a client device and used to determine the physical location of the client device or trigger an action on the client device.

### SUMMARY

**[0005]** Beacon applications for content discovery and interaction include triggering features in applications, application discovery, embedding beacon information in streaming media, synchronizing the presentation of content on mobile devices and automatic configuration of mobile devices.

**[0006]** In some implementations, a method comprises: receiving, by a device, streaming media; obtaining, by the device, beacon information embedded in the streaming media, the beacon information including at least a beacon identifier and a content identifier, the beacon identifier identifying a radio frequency beacon in the environment;

**[0007]** broadcasting, by the device, the streaming media into the environment; and concurrently with the broadcasting of the streaming media, broadcasting, by the radio frequency beacon, the beacon information into the environment.

**[0008]** In some implementations, a method comprises: receiving, by a device, beacon information broadcast from a radio frequency beacon into an environment, the beacon information obtained from streaming media that is broadcast into the environment concurrently with the beacon information, the beacon information including at least a beacon identifier identifying the radio frequency beacon and a content identifier identifying the streaming media; displaying a text message on a display of the device, where the text message is associated with the received beacon information; receiving, by the device, user input related to the text

message, the user input requesting delivery of content associated with the received beacon information; sending, by the device, a request for the content to a content provider, the request including the beacon identifier and the content identifier; and receiving, by the device, access to the requested content.

**[0009]** In some implementations, a method comprises: receiving, by a server computer configured for delivering content, a request for content from a client device in communication with the server computer, the request including a beacon identifier and a content identifier, the beacon identifier identifying a radio frequency beacon in an environment and the content identifier identifying streaming media broadcast into the environment; identifying, by the server computer, a location of the streaming media broadcast based on the beacon identifier; identifying, by the server computer, the streaming media based on the content identifier; aggregating, by the server computer, additional content based on the identified location and streaming media; combining, by the server computer, the requested content and additional content; and providing, by the server computer, the client device access to the combined content.

**[0010]** In some implementations, a method comprises: receiving, by a master device, information obtained from content presented on the master device, the information including a synchronization signal associated with the presentation of the content on the master device; and broadcasting, by the master device, the synchronization signal.

**[0011]** In some implementations, a method comprises: receiving, by a slave device over a wireless communication link, information obtained from content presented on a master device, the information including a synchronization signal associated with the presentation of the content on a master display device; and changing, by the slave device, the presentation of the content on a slave display device based on the synchronization signal.

**[0012]** In some implementations, a method comprises: receiving, by a mobile device operating in an environment, beacon information broadcast from a radio frequency beacon in the environment, the beacon information including a link to configuration data for the mobile device; and retrieving, by the mobile device, the configuration data; and configuring the mobile device according to the configuration data.

**[0013]** Other implementations are directed to systems, apparatuses and non-transitory, computer-readable storage mediums. Particular implementations disclosed herein provide one or more of the following advantages. The beacon applications for content discovery and interaction disclosed herein allow client devices to discover new content associated with an environment or event occurring in the environment, and allow the users of the client devices to interact with the content on the client devices. Content providers can use beacon applications to target content (e.g., advertising) to the users of the client devices.

**[0014]** The details of the disclosed implementations are set forth in the accompanying drawings and the description below. Other features, objects and advantages are apparent from the description, drawings and claims.

### DESCRIPTION OF DRAWINGS

**[0015]** FIG. 1 illustrates an example centralized beacon management system that includes a centralized beacon man-